

REMARKS

The Official Action and the protracted rejections set forth in the eleven pages of Office Action under the provisions of 35 USC 112, paragraphs 1 and 2 have again been carefully reviewed. The review strongly indicates that the claims, as amended, in the absence of any cited prior art, should be allowed. Accordingly, reconsideration and allowance are respectfully requested.

In advance of addressing the grounds upon which the rejections have been made, applicants are of the conviction that a summarization of the essentials of the invention's thermal tolerant mannanase from *acidothermus cellulolyticus* is needed to enable proper perspective of the invention's metes and bounds, and to establish a clearer grasp of the contributions made to the art of thermal tolerant enzymes useful for degradation of mannans.

The invention provides a novel ManA member of the glycoside hydrolase (GH) family of enzymes, that is a thermal tolerant glycoside hydrolase useful in the degradation of mannans. ManA polypeptides of the invention include those having an amino acid sequence shown in SEQ ID NO:1, and polypeptides having substantial amino acid sequence identity to the amino acid sequence of SEQ ID NO:1 and useful fragments thereof, including, a catalytic domain having significant sequence similarity to the GH5 family, a first carbohydrate binding domain (type II) and a second carbohydrate binding domain (type III).

The invention also provides a polynucleotide molecule encoding ManA polypeptides and fragments of ManA polypeptides, such as catalytic and carbohydrate binding domains. Polynucleotide molecules of the invention include those molecules having a nucleic acid sequence as shown in SEQ ID NO:2; those that hybridize to the nucleic acid sequence of SEQ ID

NO:2 under high stringency conditions; and those having substantial nucleic acid identity with the nucleic acid sequence of SEQ ID NO:2 and variants and derivatives of the ManA polypeptides, including fusion proteins such as ManA polypeptide fused to a heterologous protein or peptide.

Claims 64 and claims 65-73 were rejected under the second paragraph 35 USC 112 on allegations of failing to particularly point out and distinctly claim the invention; however, in view of the amendments to these claims, the rejection is no longer applicable.

Withdrawal of the rejection is respectfully requested.

Claims 26-34, 43-44, 63-68 and 73 were rejected under the first paragraph of 35 USC 112 on allegations of lack of enablement; however, it is not any mannanase that is under consideration in the instant case, but instead, the purified ManA polypeptide consisting of a catalytic domain glycoside hydrolase family 5 (GH5), a carbohydrate binding domain III, and a carbohydrate binding domain II, in that order. As such, the scope of these claims are clearly not in doubt under the criteria laid down in In Re Wands. But in any case, these claims, as amended, surmount the rejection.

Withdrawal of the rejection is respectfully requested.

Claims 65, 67-68 and 73 were rejected under the first paragraph of 35 USC 112 on allegations that the subject matter described was not reasonably conveyed so as to denote the inventors had possession of the claimed invention at the time the application was filed; however, it is not in fact the case that these claims are directed to a genus of polypeptides including modified polypeptide sequences that have not been disclosed. The reason is that: SEQ ID NO:1 and 3, 4, and 5 are clearly set forth in Table 1 on page 18, Table 2 on page 22, Table 3 on pages 33 and 34, Table 4 on page 6, and Table 5 on page 7. The contents of these Tables are representative, without undue experimentation, for the contention that the inventors had


possession of the claimed invention at the time the application was filed. As such, the contents of the Tables should not have to be recited in claims 64-68 and 73 since these claims by established patent law must be read in light of the disclosure. In any case, as amended, the claims avoid the rejection.

Withdrawal of the rejection is respectfully requested.

Applicants acknowledge with appreciation, the indication that claims 10 and 11 are allowable. In view of the fact that the claims now remaining in the application are now patterned upon claims 10 and 11, the application should be allowed.

In view of the foregoing amendments, remarks and explanations, it is believed that the application is now in condition for allowance and early notification of the same is earnestly solicited.

Respectfully submitted,


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